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II. *New Experiments upon Ice; taken from*
Abbé Nolet, F. R. S. at Paris, and commu-
nicated by J. T. Desaguliers, F. R. S.

I. ICE that begins to melt, and Water that begins to freeze, have always the same Degree of Cold.

2. That Cold may be increas'd by a Mixture of Salts.

3. It has been thought for a long time, that *Salt-petre* was most fit to increase the Cold of *Ice*; but Experiments have shewn, that few Salts increase Cold so little as that Salt. Mix one Part of fine *Salt-petre* with two Parts of beaten *Ice*, and *Monf. Reaumur's* Thermometer will descend in it but $3\frac{1}{2}$ Degrees below the freezing Point.

What had caus'd this Mistake, is, that People generally made use of *Salt-petre* of the first or second Melting, as being the cheapest; but that *Salt-petre* not being purified, contains a great deal of *Sea-Salt*; and it was in Proportion to the Quantity of the *Sea-Salt* that the Effect was the greater.

From this last Observation, one may deduce an advantageous Method for trying *Gunpowder*; for as of the three Ingredients of which it is made up, *Salt-petre* is the only one that can increase the Cold of *Ice*; if one Part of *Gunpowder*, or a little more, be mix'd with two Parts of *Ice*, and it increases its Cold more than $3\frac{1}{2}$ Degrees, it is a Sign that the *Salt petre* contain'd in it is not well purified; and the best Powder

der will be that which does least increafe the Cold of *Ice*.

4. *Sea-Salt*, that is the *Bay-Salt*, which is commonly us'd at Table in *France*, and that which is immediately taken from the Mines, call'd *Sal gemmæ*, give the greatest Degree of Cold, for the most part; for *Pot-ash* gives sometimes a little more, but generally less. *Sea-Salt* mix'd with *Ice* in the abovesaid Proportion, gives 15 Degrees of Cold on *Monf. Reaumur's* Thermometer, and *Sal-gem*. 17.

5.	<i>Asbes</i> of green <i>Wood</i>	3	Degrees.
6.	of <i>Sea-Coal</i>		
7.	of <i>Vitriol</i>	2	
8.	<i>Tartar</i>	10	
9.	Common <i>Pot-ash</i> (in French call'd <i>Soude</i> <i>ordinaire</i>)	3	
10.	<i>Pot-ash</i> made of <i>Vreck</i> or <i>Sea-weed</i>	11	

This last *Pot-ash* may be substituted instead of *Sea-Salt*, for making *Ice-Creams*, in Places where *Salt* is dear, as in *France*, where it is sold for 10 Sols a Pound.

1st, Because in *France* this *Pot-ash* is sold only for 2 $\frac{1}{2}$ Sols a Pound.

2^{dly}, Because, not freezing so fast, it does not spoil the Creams by reducing them to *Ificles*.

3^{dly}, Because *Ice-Creams* made this way, will keep longer in a Condition fit to serve at Table.

11.	<i>Sugar</i>	4	Degrees.
12.	<i>Allom</i>	1 $\frac{1}{2}$	
13.	<i>Salt</i> of <i>Glas</i>	10	

14. *Sal*

14. *Sal Ammoniac* 12 $\frac{2}{3}$ Degrees.

15. *Quick-Lime* 1 $\frac{1}{4}$

16. *Sal Glauberi* 2

17. The Cold of *Ice* may still be considerably increas'd by a Mixture of *Spirit of Wine*; about a Drinking-glass full of *Spirit of Wine* to a Pound of beaten *Ice*.

18. The Cold of *Ice* will not increase, unless the *Ice* melts.

E X P E R I M E N T S.

Put into one Vessel four Ounces of *Ice* beaten very small, and into another Vessel two Ounces of *Sea-Salt*; set the two Vessels in a Mixture of *Ice* and *Salt*, which is to be renew'd still, till by means of the Thermometer you find, that the *Salt* and the *Ice* of the two first Vessels have acquir'd each of them 10 or 12 Degrees of Cold; then mix your *Salt* with your *Ice*, and this Mixture will not increase the Degree of Cold that the Ingredients had acquir'd, because the Mixture does not melt.

But if instead of *Salt* you mix'd with your *Ice* *Spirit of Nitre* cool'd to the same Degree as the *Ice*, as this last is liquid, it will melt the *Ice*, and considerably increase its Cold.

19. Salt mix'd with Water, increases its Cold.

20. Of all Salts, *Sal Ammoniac* gives the greatest Degree of Cold; so that if that Salt has been cool'd in *Ice*, and then one Part of it be thrown into two Parts of Water cool'd to the same Degree in *Ice*, that Water will become colder than *Ice*, and will freeze other Water thrown into it in a small Quantity.

This last Observation may be applied to the cooling of Liquors where no *Ice* is to be had; for there is hardly any Place, but what has Wells: Now the Water of a Well moderately deep, wants about eight or 10 Degrees of the Cold of *Ice*; and *Sal Ammoniac* being cool'd beforehand in the Well, will, by mixing with some of the Water of that Well, come very near to the Cold of *Ice*.

III. *An Observation of the Magnetic Needle being so affected by great Cold, that it would not traverse; by Capt. Christopher Middleton, F. R. S.*

IN a Letter which was publish'd some Years ago in the *Philosophical Transactions*, (N^o 418.) I made Mention of a strange *Phænomenon* relating to the Sea-Compass, which I had frequently observed, when we were among the Ice in *Hudson's-Bay*; to wit, that the magnetic Virtue of the Needle was so far lost or destroyed, that it would not traverse as usual, even when the Ship was in a considerable Motion: And in my Voyage thither last Year, I observed our Compass would not move at all, any longer than the Quarter-Master kept touching it. We had then much Snow on the Land, and many Isles of Ice around us, and the Sea not very smooth: I order'd one of the Compasses to be brought into the Cabin, but did not find it any better, till it had stood near the Fire about a Quarter of an Hour, and then it began to traverse very well; I then order'd it to be placed in the Binnacle,